

What Is Claimed Is:

1. Apparatus for reconfiguring tissue, said apparatus comprising:

5           a shaft having a distal end and a proximal end;  
              at least one effector mechanism movably mounted to said  
distal end of said shaft, each said effector mechanism  
comprising at least one gripping element for gripping tissue  
to that effector mechanism, said at least one effector  
10          mechanism being configured to capture the gripped tissue  
against said shaft;  
              at least one actuating mechanism mounted to said  
proximal end of said shaft; and  
              at least one connection mechanism connecting said at  
15          least one actuating mechanism to said at least one effector  
mechanism, whereby a user may utilize said at least one  
actuating mechanism to actuate said at least one effector  
mechanism so as to reconfigure tissue.

20          2. Apparatus according to claim 1 wherein said shaft  
is flexible.

3. Apparatus according to claim 1 wherein said shaft has a lumen extending therethrough.

5 4. Apparatus according to claim 3 wherein said lumen is sized to receive another instrument therein.

10 5. Apparatus according to claim 4 wherein said instrument comprises a working tool.

15 6. Apparatus according to claim 5 wherein said working tool comprises a stapler.

7. Apparatus according to claim 4 wherein said instrument comprises a scope.

15 8. Apparatus according to claim 1 wherein said apparatus comprises two effector mechanisms.

20 9. Apparatus according to claim 8 wherein said two effector mechanisms are pivotally mounted to said shaft.

10. Apparatus according to claim 9 wherein said distal end of said shaft comprises a longitudinal axis, and further wherein said two effector mechanisms are pivotally mounted to said shaft along a pivot axis extending parallel to said 5 longitudinal axis of said distal end of said shaft.

11. Apparatus according to claim 10 wherein said two effector mechanisms are configured to move between (i) a closed position wherein said two effector mechanisms fold 10 concentrically about said distal end of said shaft, and (ii) an open position wherein said two effector mechanisms rise like wings over said shaft.

15. Apparatus according to claim 11 wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for maintaining the tissue in such engagement while suction is maintained.

20. Apparatus according to claim 12 wherein said distal end of said shaft comprises at least one gripping element for drawing tissue against said shaft and for

maintaining the tissue in such engagement while suction is maintained.

14. Apparatus according to claim 13 wherein said  
5 distal end of said shaft comprises a plurality of gripping  
elements, with said gripping elements being positioned about  
the circumference of said shaft in the region covered by  
said effector mechanisms when said effector mechanisms are  
in said closed position.

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15. Apparatus according to claim 14 wherein said  
gripping elements comprise suction pods.

16. Apparatus according to claim 15 wherein said  
distal end of said shaft comprises at least one fastening  
mechanism for securing tissue to tissue.

20 17. Apparatus according to claim 16 wherein said at  
least one fastening mechanism is adapted to extend radially  
outward from said distal end of said shaft.

18. Apparatus according to claim 17 wherein said mechanism comprises a staple.

5           19. Apparatus according to claim 1 wherein said at least one connection mechanism comprises a cable.

20. Apparatus according to claim 1 wherein said apparatus comprises one effector mechanism.

10          21. Apparatus according to claim 20 wherein said effector mechanism is pivotally mounted to said shaft.

15          22. Apparatus according to claim 21 wherein said distal end of said shaft comprises a longitudinal axis, and further wherein said effector mechanism is pivotally mounted to said shaft along a pivot axis extending transverse to said longitudinal axis of said distal end of said shaft.

20          23. Apparatus according to claim 22 wherein said effector mechanism is configured to move between (i) a closed position wherein said effector mechanism folds concentrically about said distal end of said shaft, and (ii)

an open position wherein said effector mechanism rises over  
said shaft.

24. Apparatus according to claim 23 wherein said at  
5 least one gripping element comprises a suction pod for  
drawing tissue against the effector mechanism and for  
maintaining the tissue in such engagement while suction is  
maintained.

10 25. Apparatus according to claim 24 wherein said  
distal end of said shaft comprises at least one gripping  
element for drawing tissue against said shaft and for  
maintaining the tissue in such engagement while suction is  
maintained.

15 26. Apparatus according to claim 25 wherein said  
distal end of said shaft comprises a plurality of gripping  
elements, with said gripping elements being positioned about  
the circumference of said shaft in the region covered by  
20 said effector mechanism when said effector mechanism is in  
said closed position.

27. Apparatus according to claim 26 wherein said gripping elements comprise suction pods.

5           28. Apparatus according to claim 27 wherein said apparatus further comprises a septum extending between said shaft and said effector mechanism.

10          29. Apparatus according to claim 28 wherein said distal end of said shaft comprises at least one fastening mechanism for securing tissue to tissue.

15          30. Apparatus according to claim 29 wherein said at least one fastening mechanism is adapted to extend radially outward from said distal end of said shaft.

31. Apparatus according to claim 30 wherein said fastening mechanism comprises a staple.

20          32. Apparatus according to claim 1 wherein said apparatus comprises a plurality of effector mechanisms.

33. Apparatus according to claim 32 wherein said plurality of effector mechanisms extend out of the distal end of said shaft.

5           34. Apparatus according to claim 33 wherein said distal end of said shaft comprises a longitudinal axis, and further wherein said plurality of effector mechanisms extend parallel to said longitudinal axis of said distal end of said shaft.

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35. Apparatus according to claim 34 wherein said plurality of effector mechanisms are configured to move between (i) a first position wherein said plurality of effector mechanisms collectively form a tubular configuration, and (ii) a second position wherein said plurality of effector mechanisms collectively form a non-tubular configuration.

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20           36. Apparatus according to claim 35 wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for

maintaining the tissue in such engagement while suction is maintained.

5           36. Apparatus according to claim 35 wherein said plurality of gripping elements comprise at least one fastening mechanism for securing tissue.

10          37. Apparatus for reconfiguring tissue, said apparatus comprising:

15          a shaft having a distal end and a proximal end, wherein said distal end of said shaft comprises at least one gripping element for drawing tissue against said shaft and for selectively maintaining the tissue in such engagement; two effector mechanisms movably mounted to said distal end of said shaft, each said effector mechanism comprising at least one gripping element for gripping tissue to that effector mechanism, said two effector mechanisms being configured to capture the gripped tissue against said shaft, wherein said distal end of said shaft comprises a longitudinal axis, wherein said two effector mechanisms are pivotally mounted to said shaft along a pivot axis extending parallel to said longitudinal axis of said distal end of

said shaft, wherein said two effector mechanisms are configured to move between (i) a closed position wherein said two effector mechanisms fold concentrically about said distal end of said shaft, and (ii) an open position wherein said two effector mechanisms rise like wings over said shaft, and wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for maintaining the tissue in such engagement while suction is maintained;

10           at least one actuating mechanism mounted to said proximal end of said shaft; and

              at least one connection mechanism connecting said at least one actuating mechanism to said two effector mechanisms, whereby a user may utilize said at least one actuating mechanism to actuate said two effector mechanisms so as to reconfigure tissue.

15           38. Apparatus for reconfiguring tissue, said apparatus comprising:

20           a shaft having a distal end and a proximal end, wherein said distal end of said shaft comprises at least one gripping element for drawing tissue against said shaft and

for maintaining the tissue in such engagement while suction is maintained;

an effector mechanism movably mounted to said distal end of said shaft, said effector mechanism comprising at least one gripping element for gripping tissue to that effector mechanism, said effector mechanism being configured to capture the gripped tissue against said shaft, wherein said distal end of said shaft comprises a longitudinal axis, wherein said effector mechanism is pivotally mounted to said shaft along a pivot axis extending transverse to said longitudinal axis of said distal end of said shaft, wherein said effector mechanism is configured to move between (i) a closed position wherein said effector mechanism folds concentrically about said distal end of said shaft, and (ii) an open position wherein said effector mechanism rises over said shaft, and wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for maintaining tissue in such engagement while suction is maintained;

at least one actuating mechanism mounted to said proximal end of said shaft; and

at least one connection mechanism connecting said at  
least one actuating mechanism to said effector mechanism,  
whereby a user may utilize said at least one actuating  
mechanism to actuate said effector mechanism so as to  
5 reconfigure tissue.

39. Apparatus for reconfiguring tissue, said apparatus comprising:

a shaft having a distal end and a proximal end;  
10 a plurality of effector mechanisms mounted to said  
distal end of said shaft, each said effector mechanism  
comprising at least one gripping element for gripping tissue  
to that effector mechanism, said plurality of effector  
mechanisms being configured to capture the gripped tissue  
15 against said shaft, wherein said distal end of said shaft  
comprises a longitudinal axis, wherein said plurality of  
effector mechanisms extend parallel to said longitudinal  
axis of said distal end of said shaft, wherein said  
plurality of effector mechanisms are configured to move  
20 between (i) a first position wherein said plurality of  
effector mechanisms collectively form a tubular  
configuration, and (ii) a second position wherein said

plurality of effector mechanisms collectively form a non-tubular configuration, and wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for maintaining the  
5 tissue in such engagement while suction is maintained;

at least one actuating mechanism mounted to said proximal end of said shaft; and

10 at least one connection mechanism connecting said at least one actuating mechanism to said plurality of effector mechanisms, whereby a user may utilize said at least one actuating mechanism to actuate said plurality of effector mechanisms so as to reconfigure tissue.

15 40. A method for reconfiguring tissue, said method comprising:

providing apparatus comprising:

a shaft having a distal end and a proximal end, wherein said distal end of said shaft comprises at least one gripping element for drawing tissue against said shaft and  
20 for selectively maintaining the tissue in such engagement;

two effector mechanisms movably mounted to said distal end of said shaft, each said effector mechanism

comprising at least one gripping element for gripping tissue to that effector mechanism, said two effector mechanisms being configured to capture the gripped tissue against said shaft, wherein said distal end of said shaft comprises a  
5 longitudinal axis, wherein said two effector mechanisms are pivotally mounted to said shaft along a pivot axis extending parallel to said longitudinal axis of said distal end of said shaft, wherein said two effector mechanisms are configured to move between (i) a closed position wherein said two effector mechanisms fold concentrically about said  
10 distal end of said shaft, and (ii) an open position wherein said two effector mechanisms rise like wings over said shaft, and wherein said at least one gripping element comprises a suction pod for drawing tissue against the  
15 effector mechanism and for maintaining the tissue in such engagement while suction is maintained;  
  
at least one actuating mechanism mounted to said proximal end of said shaft; and  
  
at least one connection mechanism connecting said  
20 at least one actuating mechanism to said two effector mechanisms, whereby a user may utilize said at least one

actuating mechanism to actuate said two effector mechanisms so as to reconfigure tissue;

positioning said two effector mechanisms in said closed position;

5 advancing said apparatus so that said distal end of said shaft is positioned adjacent tissue to be reconfigured;

positioning said two effector mechanisms in said open position;

gripping tissue against said distal end of said shaft  
10 and against said two effector mechanisms; and

positioning said two effector mechanisms in said closed position so as to reconfigure the gripped tissue and capture that tissue against said shaft.

15 41. A method according to claim 40 wherein said method comprises the additional step of securing the tissue in its reconfigured condition.

20 42. A method according to claim 40 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus.

43. A method according to claim 42 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus wrapped by stomach tissue.

5           44. A method for reconfiguring tissue, said method comprising:

providing apparatus comprising:

a shaft having a distal end and a proximal end, wherein said distal end of said shaft comprises at least one gripping element for drawing tissue against said shaft and for maintaining the tissue in such engagement while suction is maintained;

10           an effector mechanism movably mounted to said distal end of said shaft, said effector mechanism comprising at least one gripping element for gripping tissue to that effector mechanism, said effector mechanism being configured to capture the gripped tissue against said shaft, wherein said distal end of said shaft comprises a longitudinal axis, wherein said effector mechanism is pivotally mounted to said shaft along a pivot axis extending transverse to said longitudinal axis of said distal end of said shaft, wherein said effector mechanism is configured to move between (i) a

closed position wherein said effector mechanism folds concentrically about said distal end of said shaft, and (ii) an open position wherein said effector mechanism rises over said shaft, and wherein said at least one gripping element comprises a suction pod for drawing tissue against the effector mechanism and for maintaining tissue in such engagement while suction is maintained;

5                         at least one actuating mechanism mounted to said proximal end of said shaft; and

10                         at least one connection mechanism connecting said at least one actuating mechanism to said effector mechanism, whereby a user may utilize said at least one actuating mechanism to actuate said effector mechanism so as to reconfigure tissue;

15                         positioning said effector mechanism in said closed position;

                           advancing said apparatus so that said distal end of said shaft is positioned adjacent tissue to be reconfigured;

20                         positioning said effector mechanism in said open position;

                           gripping tissue against said distal end of said shaft and against said effector mechanism; and

positioning said effector mechanism in said closed position so as to reconfigure the gripped tissue and capture that tissue against said shaft.

5           45. A method according to claim 44 wherein said method comprises the additional step of securing the tissue in its reconfigured condition.

10          46. A method according to claim 42 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus.

15          47. A method according to claim 46 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus wrapped by stomach tissue.

20          48. A method for reconfiguring tissue, said method comprising:

              providing apparatus comprising:

              a shaft having a distal end and a proximal end;

              a plurality of effector mechanisms mounted to said distal end of said shaft, each said effector mechanism comprising at least one gripping element for gripping tissue



positioning said effector mechanisms in said first position;

advancing said apparatus so that said distal end of said shaft is positioned adjacent tissue to be reconfigured;

5 gripping tissue against said distal end of said shaft and against said effector mechanisms; and

positioning said effector mechanisms in said second position so as to reconfigure the gripped tissue and capture that tissue against said shaft.

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49. A method according to claim 48 wherein said method comprises the additional step of securing the tissue in its reconfigured condition.

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50. A method according to claim 48 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus.

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51. A method according to claim 50 wherein said tissue comprises stomach tissue reconfigured into a neoesophagus wrapped by stomach tissue.

52. A method for treating GERD, comprising:

creating a neoesophagus that extends into the abdomen.

53. A method according to claim 52 wherein said method  
further comprises the step of wrapping the stomach around  
5 the neoesophagus.